

ART. II.—*Practical Observations on Organic Obstructions of the Œsophagus; preceded by a case which called for Œsophagotomy and subsequent opening of the Trachea; with accompanying illustrations.* By JOHN WATSON, M. D., Surgeon to the New York Hospital.

MR. John Ames, of Easton, Massachusetts, aged 24, of tall and spare habit, previously in the enjoyment of moderate health, was seized in the latter part of October, 1843, with a cough, which lasted for a week or two, and left him, about the first of November, with marked difficulty of deglutition. Having always had what he called a narrow swallow, and being subject to frequent turns of choking, he did not at first pay much attention to the present difficulty. But it soon became more serious, obliging him frequently to leave the table while eating, and, at length, to eat by himself, and with the utmost caution.

He consulted a surgeon of Boston, sometime during November, who recommended the occasional introduction of a probang, the application of a blister to the throat, and daily inunction with hydriodate of potassa ointment around the neck. This course was followed for a few weeks, without relief. About the 1st of January, 1844, the difficulty had so far increased, that he was obliged to relinquish the use of solid food, and to subsist wholly on soft and fluid substances. He came to New York about the middle of January, and the surgeon whom he first consulted here, thought he was enabled to pass an ordinary urethral catheter below the seat of obstruction in the throat.

The patient came under my care on the 19th of January. At that date it was utterly impossible to pass an instrument of any size beyond the point of stricture. A gum-elastic catheter, introduced by the mouth, came in contact with the obstruction, at the distance of seven inches from the edge of the front teeth of the upper jaw. The patient was living entirely on fluids. He was free from cough, he had no pains of any sort, no soreness or tenderness about the throat either from pressure or from attempting to swallow. He was evidently emaciated and enfeebled; he had a frequent and copious flow of saliva and mucus from the mouth, probably in consequence of the obstruction to the passage of these fluids downwards. The thyroid bodies were larger than usual, and one or two lymphatic glandular swellings existed on either side of the throat, just below the angles of the jaw. The fauces were free from inflammation, the tonsils were not enlarged. The epiglottis could be fairly brought into view by depressing the tongue; but every thing about the fauces, within the range of vision or within the reach of the finger, was perfectly healthy. The patient had never before suffered from any severe illness. He was one of a numerous family, none of whom were subject to any serious disorder. He had, however, always been rather delicate. His mother had for years supposed he was of a serofulous diathesis.

He had once had an obstinate sore on his chin, which gave rise to this opinion.

At my first visit, I put him on the use of hydriodate of potassa, grs. v. in solution, three times a day. I directed a blister to be applied on each side of the neck; and as he could swallow only fluids, advised a diet of milk. The blisters were kept open about ten days; and in the mean time I frequently attempted to get an œsophagus bougie beyond the stricture, introducing it sometimes through the mouth, sometimes through the nostrils; sometimes passing a large hollow instrument down to the obstruction, and leaving it there for an hour together; or passing a smaller instrument through the larger one; but all without success. At times the instrument appeared to clear the stricture and pass onwards; but, on withdrawing it, I invariably found that this apparent success depended on a doubling of the extremity of the bougie.

Failing with simple bougies and catheters, on the 27th of January I passed an armed bougie, through a hollow catheter, down to the stricture, and allowed a piece of lunar caustic, about the size of a pin's head, to melt at the seat of obstruction. This caused some soreness, but did no good. The caustic application was repeated on the day following. It appeared rather to aggravate than to relieve the difficulty.

With a view to an operation for getting into the œsophagus, beyond the stricture, I now requested a consultation. The patient was accordingly seen, first, by Dr. Stevens, then by Drs. Rodgers, Hoffman and Post; all of whom expressed their conviction as to the necessity of the measure, the obstruction being now so great that the patient was unable to say whether any portion of his fluid food actually passed into the stomach or not.

On the 2d of February, wishing to delay the operation until the arrival of his friends from the country, he was obliged to resort to nutritive injections. For the ten succeeding days, these were steadily administered through a long gum-elastic tube passed into the colon. They consisted of beef tea, broth containing boiled flour, boiled starch and arrow-root, boiled eggs, and such other articles as could be administered. The injections had a marked effect in recruiting his strength and in assuaging the sense of hunger. They increased the volume of the pulse and the fulness of the capillary vessels. But at times they excited tormina; and, occasionally, they purged him, especially when they chanced to be too highly seasoned with salt.

*Feb. 12th.* The patient had all the morning been suffering from tormina; his pulse was feeble, ranging at 120; but he was otherwise in a favourable condition. I commenced the operation about one o'clock, P. M., assisted by Drs. Stevens, Rodgers, Hoffman, Post and Buck, in the presence of several of my own students, and a few of the friends of the patient. Having previously placed him on a cot near a window, with his back well supported by pillows, and his head thrown gently backwards, I commenced the first incision on the left side of the neck, midway between the os hyoides and



the upper border of the thyroid cartilage, just in front of the sterno-mastoid muscle; carrying it downwards parallel with the edge of this muscle to within an inch of the sterno-clavicular articulation; dividing, in this course, the skin, superficial fascia and platysma-myoides muscle. A second incision, of an inch in length, was made nearly parallel with the upper edge of the thyroid cartilage, terminating posteriorly at the upper extremity of the first, and extending to the same depth. After turning up the flap of integument at the angle of these cuts, a glandular tumour, about the size of a hazelnut, was exposed and removed from among the layers of the deep fascia. It was found to be very hard, and to contain yellowish concrete pus in its centre. The dissection was then continued through the deep fascia. The omo-hyoid muscle was exposed and divided; the superior thyroid artery was brought into view, secured by two ligatures and divided between these. The loose cellular tissue between the main cervical vessels and nerves on the one hand, and the trachea, &c., on the other, was next separated, mostly by the handle of the scalpel, until the lower part of the pharynx and a portion of the œsophagus were fairly exposed. This muscular structure was put upon the stretch at every attempt of the patient to swallow. The finger could now be passed between the œsophagus and the anterior face of the spinal column; and the pulsations of the right carotid could be seen and felt through this space, by slightly elevating and rotating the larynx and œsophagus. The edges of the wound were now well dilated by curved spatulas. I next attempted to seize and puncture the wall of the pharynx, about an inch below the corner of the thyroid cartilage; but, owing to the yielding nature of its muscular texture, I found great difficulty in doing this without endangering the important structures in the neighbourhood. In order to steady the parts, I was finally obliged to introduce a silver catheter through the mouth on towards the stricture, and to cut upon the point of this instrument. On opening the gullet, I found the seat of obstruction just below the incision, and within reach of the point of the finger. But in order to divide it without risking any injury to the ascending thyroid artery, I was obliged to reach it from without. For which purpose, and in order to give more room at the bottom of the wound, I divided the sterno-mastoid muscle transversely, and turned down the upper border of the thyroid gland. In this process the recurrent nerve was brought into view; and one of the branches of the superior thyroid artery, as it entered the gland, was divided, giving rise to the only hemorrhage worth speaking of during the operation. The vessel was soon secured; and, after much difficulty and delay, the division of the strictured portion of the œsophagus was finally effected by an incision through its walls of at least an inch and a half in length. The obstruction, so far as I could judge at the time, appeared to depend upon a simple induration and contraction not over five or six lines wide. The surface of the œsophagus within appeared to be smooth and of its natural colour. A full

sized stomach tube was now introduced through the wound; and a glass of wine, and afterwards a full meal of boiled arrow-root, were administered. .

The patient bore the operation with uncommon fortitude. After its completion, he informed me that the pain of the incisions was trifling to that produced by the fingers and the curved spatulas used in dilating the wound. After a few moments repose, the transverse portion of the external wound was drawn together by a single suture; the rest of the wound was allowed to remain open. The stomach tube was not removed from the *œsophagus*; but its free extremity was secured to the side of the head, to prevent it from slipping inwards.

On the following day the patient was free from fever, his pulse was less frequent than on the morning of the operation; his voice was slightly altered by the pressure of the tube or the tumefaction caused by the operation; but he had no difficulty of breathing. The saliva was issuing freely through the wound. No serious symptoms followed the operation. The tube was not disturbed until the end of the sixth day. It was then withdrawn, and another introduced through the left nostril. After this the wound was dressed with adhesive straps and compress, so as to favour cicatrization.

The second tube, which was about an inch and an eighth in circumference, at first gave him some uneasiness, slightly affecting the left eye and causing some hemorrhage from the nose; but these unpleasant symptoms subsided in a few days, after which the patient began to improve rapidly. This second tube was worn twenty-five days. Towards the close of this period it became rather offensive, and produced an unpleasant taste in the mouth. It was removed on the 15th of March, and a fresh instrument of the same size immediately introduced. The wound in the neck had now contracted to a mere line, and the fistulous opening into the *œsophagus* would scarcely admit a probe. The patient, of late, had been walking about the house, and, with the exception of one or two turns of indigestion from overloading his stomach, he had not had a bad symptom. He has not, however, gained much flesh; he is rather feeble, and his pulse ranges at 100.

*March 31st.* For some days past he has complained of soreness in the throat; he has raised much phlegm, and occasionally small streaks of blood; his respiration is somewhat oppressed, particularly at night. About a week since he had a slight swelling on the right side of the neck, which subsided under the application of a tobacco poultice. The present difficulty has not yielded either to this or to the use of anodynes. I was obliged to remove the tube from the nostril. It had been worn, since the last insertion, just sixteen days, and nearly seven weeks altogether.

*April 1st.* The removal of the tube has not afforded much relief. The respiration is still embarrassed. He attempted to swallow some wine and water; but the effort brought on violent coughing, laboured breathing and other symptoms analogous to those of *œdema* of the glottis. The right side



of the neck was somewhat swollen. An enlarged lymphatic gland could be felt just below the angle of the jaw, connected with a line of induration, apparently from diseased lymphatics, extending from the jaw towards it. Pressure on this side of the neck gave him pain. An attempt was made to re-insert the tube. The effort produced the most violent spasm of the laryngeal muscles, and threatened suffocation. Unable, for the present, to restore the passage through the mouth or nostril, and unwilling to tear open the already cicatrized wound in the neck, I resorted, for a few days, again, to the nutritive injections; hoping, in the interval, that the disease in the larynx might be so far relieved as to allow the tube to pass beyond the fauces. To favour this, I had the neck penciled freely with concentrated tincture of iodine. I put the patient on anodyne inhalations and fumigations of stramonium and cinnabar, five grains of cinnabar to a pipeful of powdered stramonium leaves, to be smoked every four hours. After a day or two, the stramonium appearing to irritate the tongue, common tobacco was substituted for it.

*April 7th.* The respiration is much improved; the pulse at 88; the swelling on the right side of the neck has subsided; the integuments are sore from the action of the iodine. Since last report, there has been some slight inflammation about the fauces, which has been mitigated by holding ice in the mouth. This, as it melted, passed downwards without troubling him. He is apparently losing strength for want of food in the stomach, although he makes no complaint of hunger. Another attempt was made to insert the œsophagus tube. It passed beyond the larynx without difficulty, but was arrested somewhat lower down. I was now obliged to break open the recent cicatrix in the neck, with the point of a probe, near the centre of the original cut; and to pass a very small gum elastic catheter obliquely downwards, through the opening thus made, into the œsophagus. With my own mouth, by means of this small tube, I forced about a pint of prepared arrow root, with a small quantity of wine, into the patient's stomach. The tube was then withdrawn; and, without much effort, I immediately afterwards introduced, through the same opening, a gum elastic catheter, only one size smaller than the large tubes which he had previously worn. After having his stomach supplied with food, his strength returned to him almost miraculously. He at once got up, dressed himself and walked down stairs. In the evening I found him at the fireside, smoking his pipe of cinnabar and tobacco; his pulse fuller than before, and ranging at 100.

After this period, I had no difficulty in supplying the stomach with sufficient food. On one or two occasions there was slight obstruction to the introduction of the tube, owing, perhaps, to the position of the neck at the time; but this was readily overcome by a little careful manipulation. The tube was never afterwards allowed to rest in the wound, but was removed immediately after every meal, and introduced anew, either by the patient

himself or some of his friends, whenever he wished to supply the stomach with food.

*April 10th.* He is so far restored as to be able to walk out. On the following day he rode out as far as Bloomingdale, a distance of several miles, and conversed much with his brother, who accompanied him. This rather imprudent exposure reinduced the difficulty of breathing. On the following morning, (April 12th,) his respiration was unusually laboured; he complained of soreness on the right side of the neck opposite the larynx. The parts here were tumefied. A large blister was applied over the swelling. This drew well without relieving him. In the afternoon suffocation was imminent: his lips were purplish, his countenance anxious, his face was bathed in clammy perspiration. I directed fumigations of burning resin, and left him to prepare for opening his trachea. I saw him again soon afterwards with Dr. Buck. The inhalation of the fumes of the burning resin appeared to have produced a favourable effect. His lips were again of their natural colour; and though his respiration was noisy and laboured, he was evidently in much less immediate danger. He had of late been using anodynes at night. I now administered fifty drops of laudanum, and directed the blistered surface to be dressed with mercurial ointment.

*April 18th.* He is again walking about the house. His breathing has steadily improved. The cinnabar fumigations and mercurial inunction to the neck, which have been continued to the present date, have not affected his gums.

*April 24th.* He changed his residence, and rode without fatigue about two miles. On the second day afterwards he again complained of slight difficulty of breathing. Several lymphatic glands, behind the upper part of each mastoid muscle, were slightly enlarged. The inunction and fumigations were continued, and a tobacco poultice was again applied with apparent benefit. The profuse discharge of phlegm and saliva, which has existed since the first onset of disease, still continues.

*May 1st.* Respiration is again impeded, and is nearly as difficult as on the 12th of April last. The right side of the neck is again swollen. A blister was applied on each side of the neck; absolute repose was enjoined; small doses of Dover's powder were frequently administered during the day, to act upon the skin; and a full anodyne was given at night. This course appeared again to check the threatened laryngeal obstruction. For a few days his breathing improved; but his strength had become much impaired.

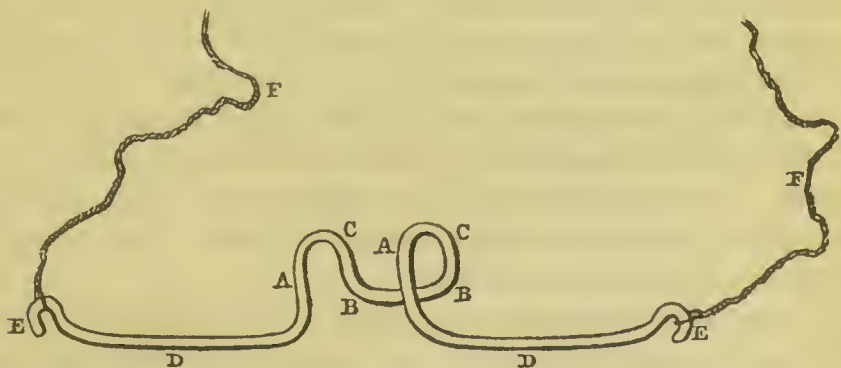
*May 8th.* For the last thirty-six hours respiration has been much embarrassed. The introduction of the stomach-tube appears to-day, for the first time, to interfere with the breathing. With the assistance of Dr. Buck I opened the trachea. The operation consisted, first, in a longitudinal division of the integument and subjacent soft parts, including a section of the transverse portion of the thyroid bodies; secondly, in securing a few vessels and arresting all existing hemorrhage; finally, in dividing the eryeo-thyroid

membrane transversely, and the crycoid cartilage longitudinally downwards through the median line, and continuing the incision through one or two of the upper rings of the trachea. The patient bore the operation well; and after the silver respirator was placed in the wound, he breathed through the instrument with perfect freedom. On the following day it was found necessary several times to remove the canula, to rid it of inspissated mucus, and at length to lay it aside, and to keep the sides of the wound expanded by two blunt hooks. For these, on the 10th, I substituted a couple of deep stitches with strong silk ligatures, one on each side; the outer ends of the ligatures being secured laterally to the sides of a circular wire about three inches in diameter, in such a way as to expand the wound and secure the wire permanently in front of the neck, as in the accompanying diagram. During the following night, notwithstanding this contrivance, the respiration became again obstructed by the accumulation of mucus, and by the overlapping of the lower part of the sides of the wound. The insertion of the canula was out of the question. I therefore substituted an extemporaneous dilator of bent wire, which I found to answer the purpose of keeping the wound well dilated, and of preventing the posterior face of the trachea from approximating the anterior. The accompanying figure\* will give a sufficiently exact idea of the shape, and of the mode of applying this instrument, which was secured round the neck by a string.

FIG. I.



FIG. II.



\* The foregoing figure represents a bent wire with a string attached to each extremity. The central curved portion being the part of the instrument for dilating the wound and expanding the trachea. The strings are used for securing the instrument in place, by tying them around the neck.

AA. The two sides that serve to expand the edges of the cut.

BC—BC. The portions of the wire that rest upon the posterior face of the trachea, and prevent it from falling forwards.

DD. The horizontal shafts of the wire passing laterally, and terminating in the loops EE, to which are attached the strings FF, for securing the instrument. These horizontal shafts may be much longer in proportion than they are here represented.



*May 11th.* The patient had passed a restless night. The lungs are apparently much congested. The patient requires to be continually fanned and to have the windows open. He is under the influence of a large anodyne, which was administered late last evening. His skin is cold, his lips pale and dry; his finger-nails and the lobes of the ears are of a purplish hue. These symptoms were relieved by resorting to wine and administering a full meal of prepared arrow-root. After this period stimulants and food in a fluid form were administered as freely as he could bear them, apparently with good effect. During the night of May 12th, he rested tolerably well; but early on the following morning, he had again sudden symptoms of collapse, in part owing to the influence of the anodyne taken on the previous evening. He was again relieved by stimulants. During the 13th he complained, for the first time, of pain in his left side. He had some cough; and the bronchial accumulations still continued to trouble him. During the evening his respiration was again easy; but in the course of the night a colliquative diarrhœa ensued. This reduced him rapidly. He expired early on the morning of the 14th of May, six days after the opening of the trachea.

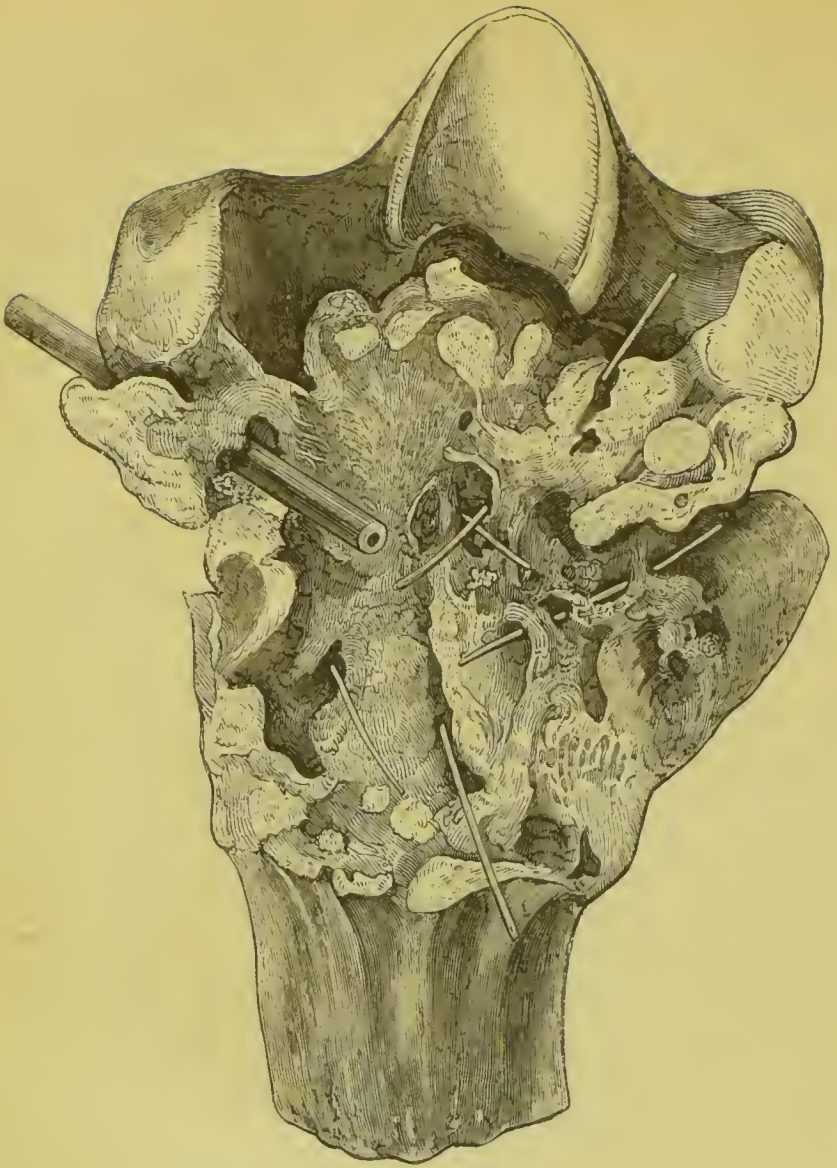
The body was examined eight hours after death. The abdominal viscera were healthy. The right cavities of the heart contained a large fibrinous concretion. The lungs were unusually large and free from all traces of tubercles. The upper lobe of the right lung was healthy. A small portion of the lower and back part of the middle lobe and the greater part of the lower lobe were in a state of red hepatization. The bronchial tubes throughout this lung were of a deep red colour, and their mucous surface had a coarse muscular appearance. The accumulation of mucus was not very great. In the ultimate bronchial ramifications of the lower lobe, there were some appearances of purulent matter. The upper lobe of the left lung was also healthy, except at its lower border, which was slightly indurated. The lower lobe was hepatized, and the bronchial ramifications in this lobe contained a few detached masses of purulent matter. The left pleura was coated with a recent exudation of coagulable lymph. The lungs were not adherent to the chest on either side.

The pouch of the pharynx and upper part of the *œsophagus*, commencing just below the base of the arytenoid cartilages and extending downward about four inches, were extensively ulcerated. The whole surface of the ulcer was irregular and of a greenish colour; its upper and lower edges were ragged and irregular. It was nearly encircled by a series of tubercular deposits of a pale, yellowish white colour, somewhat detached from one another, and of sizes varying from that of a pea to that of a small nutmeg. Their primitive seat was evidently the submucous cellular tissue. Some of them had broken down in the centre so as to admit a probe to pass through them and under the tissues, among which they were situated. The mucous membrane, over a great part of the ulcer, was wanting, or hung in shreds, or





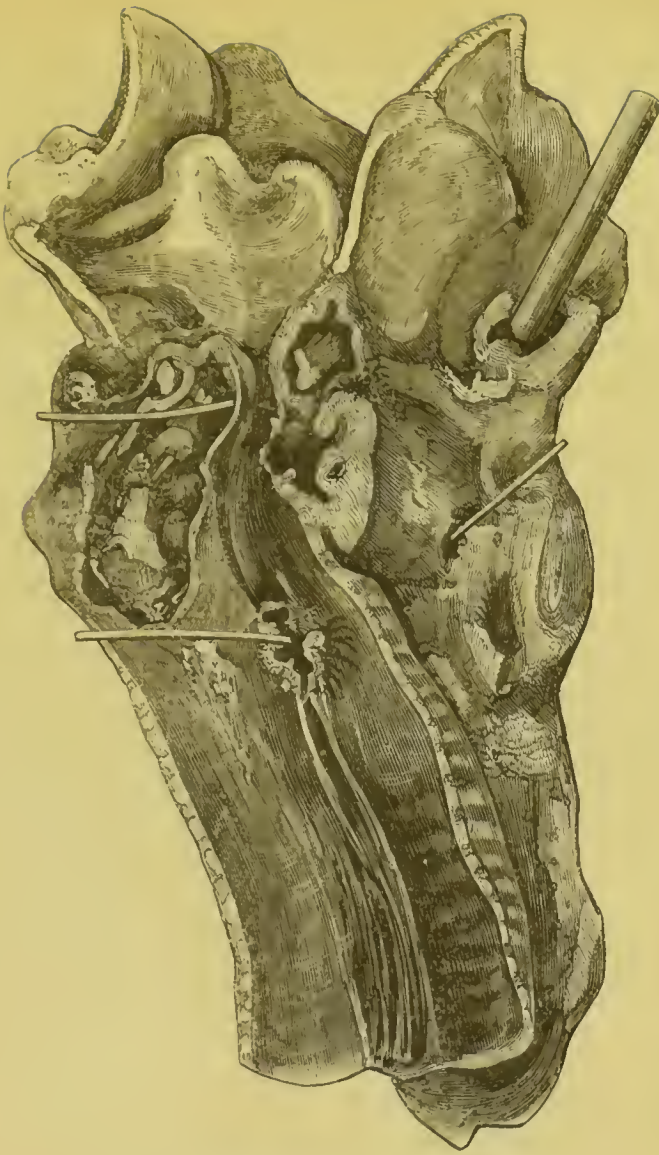
FIG. 1.



*Fig. 1* represents the interior of the pharynx and œsophagus laid open from behind, exposing the ulcerated surface nearly surrounded by a series of tuberculous deposits. Some of these deposits have disintegrated or softened in the centre, so as to allow a bristle to pass through them and beneath the ulcerated mucous membrane surrounding them. The two bristles in the centre of the figure are seen passing through the openings that communicate with the trachea. The bristle on the left passes into a large pouch or abscess that extended towards the left mastoid muscle. The piece of gum elastic catheter, seen just above this, is placed in the track of the artificial opening, which opening would have admitted an instrument three or four times as large as this. Above the upper range of tubercles, is seen a small portion of mucous membrane elevated and thrown forward so as to obstruct the view of the arytenoid cartilages.



FIG. 2.



*Fig. 2* represents the trachea and larynx laid open in front. Two bristles are seen passing through the openings between the trachea and œsophagus. The trachea is inflamed throughout, and in a state of ulceration immediately around the site of the artificial opening that was made into it about a week before death: it was of a dark greenish colour. This colour was not that of gangrene, but was merely owing to decomposing purulent and other morbid secretions. The catheter is seen, as in figure first, passing through the artificial opening into the œsophagus. A portion of integument has been left around the external orifice of this opening.





was bridled and undermined. The septum between the gullet and trachea had suffered more than any other part. On the œsophageal surface it appeared to be perforated at three or four places, but on examining it in the tracheal aspect, only two complete perforations were detected. Both of these were like irregular longitudinal slits, a quarter of an inch or more in length, one just under the lower edge of the cricoid cartilage, the other nearly two inches farther down.

The arytaenoid cartilages were pressed irregularly against each other, so as to contract the upper orifice of the larynx. The glottis was contracted and irregular, not so much from œdema, as from a contracted state and doubling forwards of the whole upper and posterior part of the larynx. The mucous membrane of the trachea, opposite the perforations and around the borders of the artificial opening, was highly inflamed and of a greenish black colour. In the lower part of the trachea, as far as the bronchial tubes, it was also inflamed, but much less so than at its upper portion.

The œsophagus immediately below the ulcer, and thence throughout its whole extent, was perfectly healthy. The artificial opening which had been made into it for supplying the patient with food, was situated about midway between the upper and lower boundaries of the ulcerated portion. The mucous membrane in the immediate neighbourhood of this opening was not so much diseased as in other parts. The orifice itself was large enough to have admitted a tube half an inch in diameter. About an inch below this, in the same side, there was an ulcerated perforation leading to a pouch, which was bounded by the inner and under part of the mastoid muscle, and was of the same dark greenish hue as the ulcerated portion of the œsophagus. Another pouch, communicating with the œsophagus, ran in, on the right side, between the middle and lower pharyngeal muscles. Its inner surface was of a light red colour, and it appeared to have been produced simply by serous and fibrinous effusions, without suppuration.

In the dissection, prior to exposing the œsophagus, an enlarged lymphatic gland, about the size of a nutmeg, was found lying on the right side of the neck in front of the mastoid muscle, and near the upper and posterior part of the larynx. It had all the characteristics of a similar tumour, removed from the opposite side of the neck during the first operation. The tissues on either side of the neck in the neighbourhood of the larynx and diseased portion of the œsophagus, were all somewhat consolidated by inflammatory adhesions. Contrary to my expectation, I found the left sterno-mastoid muscle, which had been divided transversely, so perfectly reunited that scarcely any traces of the incision were observable. A sort of cellulo-fibrous cicatrix was, on careful inspection, discovered along part of the transverse cut, but not throughout its whole extent. I may here remark that the patient, in consequence of the division of this muscle, at first found his neck weak and his head disposed to fall back in attempting to reeline ;

but this weakness was not of long continuance. There was never any torsion or lateral inclination of the neck in consequence of the division of the muscle.

It may here be asked, were there no symptoms before death indicating the existence of the perforations between the trachea and œsophagus? The first appearance that led to a suspicion of the sort, was the passage of air into and out of the artificial opening in the neck, which was noticed for eight or ten days before the operation of tracheotomy. This appearance was not constant, but was observed for a few minutes after every removal of the œsophagus tube. The next circumstance, leading to the same suspicion, I noticed, for the first time, a day or two only before death. A few drops of prepared arrow-root, after I had administered a bowlful of this through the œsophagus tube, were seen within the trachea, immediately behind the opening made by the operation of tracheotomy.

The accompanying plates will probably convey a more accurate idea of the pathological condition of the upper part of the trachea and œsophagus, than can be given by mere verbal description.

The foregoing case, in reference as much to its pathological character as to the measures instituted for its relief, is one of unusual importance. The tubercular deposits in the submucous cellular tissue around the upper part of the œsophagus, were unquestionably the starting point of disorder. They probably existed there long before the first serious manifestations of disease, and may have given rise to the "narrow swallow" with which the patient had always been affected. The extension of irritation from these to the tissues in their neighbourhood, probably induced the cough which had troubled him for a few weeks prior to the first symptoms of stricture. But up to the period of opening into the œsophagus, the disease, I am disposed to believe, had not progressed to ulceration, at least to any extent; for when opened, so far as I could see, the inner surface of the œsophagus was smooth and of its natural colour. Above the opening the finger could detect some irregularity; but there had been no discharge of blood or of purulent matter from this surface. Below the cut the tissues were also smooth, though somewhat rigid and resisting to the first introduction of the tube. This rigidity was very circumscribed, easily overcome and never subsequently observed.

Whether the long continuance of the tube in the œsophagus had much to do in favouring the spread of ulceration or not, is difficult to determine. I am disposed to think it had no marked effect in this way. The ulcer did not extend beyond the range of the tubercular deposits, although the tube reached much farther down, and was as likely to affect the mucous membrane at its lower as at its upper portion. Be this as it may, I would not, in a similar case, recommend the constant continuance of the tube in the passage. The recorded cases of foreign bodies lodged in the œsophagus



clearly show that ulceration, leading to perforations, is readily excited in this organ. With the view of allowing the cut in the neck to close, if this were desirable, I would have the patient nourished by introducing the tube anew at every meal-time, and removing it immediately afterwards. And if this proceeding could not be effected through the mouth or nostril, I should, as in the latter period of the foregoing case, relinquish all attempts to close the wound in the neck, and introduce the tube through the artificial opening.

Permanent contractions of the œsophagus are usually looked upon as the result of carcinoma. This view of these disorders has, doubtless, had much influence, hitherto, in deterring surgeons from attempting any very efficient measures for overcoming them. The disease, in the present instance, was clearly not carcinomatous. The tubercular masses were imbedded in, and not gradually diffused among the surrounding tissues. They had no appearance of organization. Some of them had become softened or disintegrated in the centre. They had given rise, at no time, to lancinating pains. The surrounding parts had not the appearance of scirrhus; and no similar deposits were found in any other part of the body. Again, the patient had many of the marks of a strumous diathesis. These circumstances, taken in connection with the existence of concrete pus in the centre of the lymphatic gland on the side of the neck, can leave no reasonable doubt as to the scrofulous nature of the disorder. It is the second instance in which, I think, I have met with a scrofulous affection of the œsophagus. The first was in a lady. The disease, in her case, was seated just above the cardiac orifice of the stomach. It had progressed to ulceration and to the formation of a large abscess in the posterior mediastinal space, communicating with the ulcerated œsophagus, and was connected with tubercular deposits in the peritoneum and in other parts of the body. But, remarkably enough, in both of these instances, the lungs contained none of these substances. I have met with other cases of permanent contraction of the œsophagus not the result of carcinoma. One of these, a mild case, recently under my care in the hospital, was the result of a burn, caused some two years before admission, by attempting to swallow some sort of very hot food. The obstruction was nearly opposite the upper end of the sternum; but was not so severe as to absolutely prevent the passage of nutriment into the stomach. Another, and much more severe case, was caused by attempting to swallow what was supposed to be a solution of corrosive sublimate. This patient was admitted into the hospital, many years since, with a concomitant affection. For nearly a week after his admission and before the stricture was discovered, he had not swallowed a particle of food or drink. Luckily the stricture was capable of dilatation by means of a stomach tube. The patient soon learnt how to use this instrument of himself. He remained, after his recovery, for many years a labouring man about the hospital; and, during this period, he was frequently obliged to resort to the use of his tube, which he kept always at hand.

The ultimately fatal result, in the case of Mr. Ames, though brought

about indirectly by the disease of the Œsophagus, should offer no objection to a repetition of the operation of Œsophagotomy under similar circumstances. The patient's life was considerably prolonged by it. The super-vention of disease in the bronchial passages, which was the immediate cause of death, should, as it appears to me, be looked upon as incidental, and not as a necessary consequence of the primary affection. And had this secondary affection not occurred, there is no reason to doubt that, so far as nutrition and digestion were involved, the patient's life would have been preserved. The opening of the trachea, called for towards the close of the case, was the means of prolonging life only for a few days.

In reference to the instruments employed for dilating the wound in the trachea, I am disposed to believe that the wire dilator, above delineated, or even the ring and lateral ligatures, may occasionally be found, as in this case, more convenient and useful than the canula of Casserius. On a former occasion I succeeded remarkably well in temporarily dilating the wound, by passing the lateral ligatures through the barrel of a quill, placed transversely across the neck, and tying their extremities together over this instrument. Any hollow tube, or a thin piece of wood, notched at either end and about three inches long, would answer a similar purpose.

Many systematic and other surgical writers, since the commencement of the last century, have spoken of Œsophagotomy as a feasible operation. But the instances hitherto published, or in which it is said to have been performed on the living subject, amount, at most, to only five. The first two of these, stated to have occurred more than a century ago, are, to say the least, of questionable authenticity; and all of them were for the removal of foreign bodies. The present, so far as I can discover, is the only instance in which this operation has been performed for supplying the stomach with food.

The older surgeons were so apprehensive of danger, in attempting to reach the Œsophagus by an incision, that in cases calling for this, they contented themselves with the use of probangs, flexible bougies, metallic sounds, blunt hooks, forceps and other similar instruments; or, as a last expedient, where the foreign body in the gullet impeded respiration, they first opened the trachea, and afterwards attempted to disembarass the Œsophagus with the probang; or, failing in this, they allowed the foreign body to work its way outward, as it might, by ulceration. Nicholas Habicot, a surgeon of Hôtel Dieu, about the beginning of the seventeenth century, was the first to open the trachea for this purpose. A youth about fourteen years of age was brought to him, who, in dread of being attacked by robbers, had swallowed nine gold pistoles enveloped in a piece of cloth. This package had lodged in the Œsophagus, and was threatening suffocation by its pressure against the trachea. Habicot at once relieved the breathing, by opening the trachea and inserting a canula, and afterwards pushed the money onward into the stomach by means of a long leaden sound.\*

\* Sprengel, tome 7, p. 142. Hevin, in *Mémoires de l'Acad. de Chirurg.* tom. 1<sup>re</sup>. Habi-



Jean-Baptiste Verduc, a surgeon of Paris, about a century after Habicot, was the first to suggest the operation of opening into the œsophagus. If the foreign body, says he, cannot be otherwise dislodged, and the patient is in danger of suffocation, I am disposed to think that pharyngotomy might be attempted. For this we should proceed as for bronchotomy. The bronchial muscles should be separated in order to reach the œsophagus in the most direct manner; and this passage should afterwards be opened longitudinally over the situation of the foreign body. M. Hevin,\* from whom I have borrowed this passage, has taken much trouble to enforce the suggestion of Verduc. But Guattani, a surgeon of Rome, about the middle of the last century, proceeded a step farther.†

A drunken fellow tossing up a chestnut, to catch it in his mouth as it fell, unluckily allowed it to slip directly into the œsophagus, and could not afterwards dislodge it. In an hour or two after the accident, finding himself unable to swallow, he applied for relief at the hospital to which Guattani was attached. The patient being intoxicated, and having, as yet, no difficulty of breathing, some doubt was at first expressed as to the existence of the nut in the gullet, especially as it could not be felt externally. The case soon took a serious turn. The introduction of any instrument into the throat was found to be extremely difficult, in consequence of the convulsive action of the muscles of the lower jaw. Symptoms analogous to those of delirium tremens ensued, accompanied with heat in the throat, and inability to swallow. For some days the patient was supported solely by nutritive injections. On the sixth day, notwithstanding several previous venesections, he was seized with severe epistaxis; and this recurred several times afterwards. On the eighth day his respiration became embarrassed. On the tenth he was able to swallow; and a singular sort of noise was produced by deglutition. He died on the nineteenth day. The œsophagus was found firmly contracted immediately above and below the nut. This had partially escaped from the passage into an ulcerated opening, and lay just outside and to the left of the trachea. The membranous portion of the trachea was sphacelated, and perforated by an opening large enough to admit a small bean; and by means of this opening a free communication had been established between the trachea and œsophagus.

This unfortunate case appears to have led Guattani to inquire into the measures best calculated to avert a similar catastrophe. He examined into the anatomical relations of the gullet; operated several times on the dead

cot's work, from which these authors quote, is entitled "*Question Chirurgicale sur l'Opération de la Bronchotomie*," printed in 4to. at Paris, 1620. He died in 1624.

\* *Précis d'Observations sur les corps étrangers arrêtés dans l'Œsophage.* Par M. Hevin, in the first volume of the *Mémoires de l'Acad. de Chirurg.* J. B. Verduc's *Traité des Opérations de Chirurgie*, was published at Paris in 1701.

† *Mém. de l'Acad. de Chirurg.* 8vo. Paris, 1819, tome 3, p. 343.



body, and on numerous living animals; and, finally, demonstrated to some of the surgeons of Paris a mode of opening into the *œsophagus* which, if not the most approved, was, at the time, sufficient to establish the practicability of the operation. His method, essentially the same as that formerly suggested by Verduc, has never been carried into effect on the living body. He reaches the *œsophagus* on the left side of the neck, by a wound passing between the sterno-hyoid and sterno-thyroid muscles on the one hand, and the trachea on the other.

In the third volume of the *Mémoires de l'Académie Royale de Chirurgie*, containing his essay on this subject, I find a brief notice of two cases, in which *œsophagotomy* is said to have been actually performed. These cases are not detailed, nor were they noticed on the authority of the operators. The first occurred as early as 1738, some twenty years before its announcement, in the practice of M. Goursauld, a provincial surgeon; and the second in that of M. Rowland, a surgeon of the French army. Long before this period, operations had been performed for extracting needles, and even fragments of bone that had escaped from the gullet into abscesses or adventitious openings, so as to be readily detected beneath the integuments on the side of the neck. Several such cases are in fact referred to by M. Hevin. But the procedure for the removal of substances thus situated, is of much less serious moment than the operation of *œsophagotomy*. Subsequent to the time of Guattani, several new suggestions were offered, and instruments devised by Vacca and others for rendering the operation in question less formidable. Baron Larrey,\* on one occasion, succeeded in removing the fragment of a bayonet which had long remained concealed behind the fauces, by puncturing the posterior pillar of the fauces with what he calls a pharyngotome, and afterwards withdrawing the foreign body, by means of a forceps, through the mouth. But the operation of *œsophagotomy* appears never to have been fairly attempted, prior to its successful performance by M. L. J. Begin, Surgeon Major to the Military Hospital of Val-de-Grâce, on the 15th of January, 1832.

A soldier, 24 years of age and in good health, while eating soup on the 4th of January, 1832, allowed a small fragment of bone to enter the *œsophagus*, and, being unable to rid himself of it, he applied at once to his regimental surgeon for relief. Several ineffectual efforts were made both before and after the man entered the hospital, to remove the bone from the part. On the 8th of January he was seen for the first time by M. Begin. The patient experienced much pain in deglutition, accompanied with a sense of tension in the neck. His respiration was embarrassed, at times so much so as to threaten suffocation. The left side of the neck was tumefied. He could not open his mouth freely, nor throw his head backwards suffi-

\* Clinique Chirurgicale, tome 2, p. 133.

ciently to admit of full exploration of the fauces. He had a copious flow of mucus and saliva from the mouth. The bone could be detected by introducing a gum-elastic sound to the distance of seven or eight inches, but could not be moved, either upwards or downwards, by any instrument introduced into the fauces. Deglutition, however, was not absolutely interrupted. Having in vain essayed the use of probangs, curved forceps and blunt hooks of flexible metal; palliating the symptoms, in the mean while, as much as possible by leeches, mucilaginous drinks and other similar measures; and fearing that, if allowed to remain, the foreign substance might perforate the trachea, or pass laterally into some of the great vessels of the neck; M. Begin, on the 15th of January, twelve days after the accident, resolved upon the operation of œsophagotomy.

With his face toward the patient's left side, he commenced his incision a finger's breadth above the sterno-clavicular articulation, and carried it parallel to the trachea along the left side of the neck, in front of the sterno-mastoid muscle, as far up as the thyro-hyoidean space; through skin, superficial fascia, platysma-myoides and deep fascia, into the cellular space between the trachea and œsophagus on the one side and the great vessels and nerves on the other; dividing, as he progressed, the omo-hyoid muscle, and placing a ligature on the superior thyroid artery, or one of its branches, which had been divided. These incisions brought him to a large sloughy abscess, which he found communicating with the œsophagus. The foreign body was discovered somewhat further down, in the portion of the œsophagus corresponding with the middle of the first bone of the sternum. After much difficulty it was dislodged and removed by the aid of a blunt hook. For some time afterwards food was administered by the occasional introduction of the stomach-tube. On the 20th of February the wound in the neck had cicatrized. The patient was afterwards exhibited, perfectly cured, to the Royal Academy of Medicine.

Remarkably enough, before this patient had left the hospital, another was admitted almost precisely similar. This second patient, also a soldier, aged 28, in eating soup, on the 13th of February, swallowed a fragment of bone which lodged in the œsophagus. The symptoms were not quite so grave as in the first case; but the foreign body was quite as firmly impacted in this part, and could neither be depressed nor removed by any sort of instrument, through the mouth. Deglutition and respiration became seriously involved; and, on the 19th, M. Begin was obliged to open the œsophagus. On exposing this, an unnatural prominence, caused by an angular projection of the bone against its coats, could be felt at the bottom of the wound just above the level of the sternum, but too low to be reached by an incision upon it without endangering the inferior thyroid artery. The œsophagus was opened at some distance above the projection. The forceps was afterwards introduced, and the foreign substance was thus removed without difficulty. Symptoms somewhat serious followed the operation.

On the fourth day, after an attack of coughing, the patient discharged a great quantity of pus through the wound. The flow continued for at least twenty-four hours; and, after this discharge, the patient began to recover. Before the wound had cicatrized, another abscess formed beyond the sternomastoid muscle just above the clavicle. This was opened on the 26th of March. The patient left the hospital perfectly well on the 9th of April following.\*

The third and only other instance in which this operation has been performed for the removal of foreign substances, is recorded by Mr. James M. Arnott, surgeon to the Middlesex Hospital, London, in the 18th volume of the *Medico-Chirurgical Transactions*. The patient was a child only two years and a quarter old. The offending body, as in the two former cases, was a piece of bone. The operation was performed on the 21st of January, 1833, four weeks after the accident, and not until the respiratory organs had become seriously involved. The child bore the operation well; but the case resulted fatally, fifty-six hours afterwards, from inflammation of the lungs.

The case which I have reported, then, should be looked upon as the fourth authentic instance in which œsophagotomy has been performed on the living subject; and as the only one in which it has been employed for the relief of stricture.

The operative procedures of M. Begin, Mr. Arnott and myself, although essentially alike, differ in some important points from one another. The first of these surgeons, operating on the left side of the neck, carries his incisions from below upward. If the foreign body within the œsophagus causes any projection, and is within reach, he cuts directly upon it. "But in a different case," says he, "the bistoury should be boldly plunged into the œsophagus parallel to its axis, at the middle of the wound, so as to lay it open to the extent of half an inch.† The incisions from below upward will enable the operator to use his left hand for dilating the wound and protecting the vessels and nerves on the side of the neck. These objects, however, can be quite as well effected by a curved spatula in the hands of an assistant. But as to plunging the bistoury boldly into the œsophagus, I must seriously protest against it. The yielding nature of this organ, even when its muscular fibres are put upon the stretch in deglutition, renders any attempt to incise it extremely difficult. It is readily fixed by passing a silver catheter or a firm gum-elastic tube into it. But a bold stroke of the knife, by transfixing the œsophagus, might readily endan-

\* *Journal Universel et Hebdomadaire*, vol. ii., April, 1833.

† *Dictionnaire de Méd. et de Chirurg. Pract.* Article, *Œsophagotomie*, vol. 12, p. 153:—"Si le corps étranger faisait une saillie appréciable sur quelque point, il faudrait inciser immédiatement sur lui. Dans le cas contraire, le bistouri doit être hardiment plongé dans l'œsophage," &c.



ger the recurrent nerve or the large blood-vessels on the opposite side of the neck ; or, passing obliquely forward, might perforate the trachea.

Mr. Arnott performed his operation on the right side of the neck. His incisions extending from the upper part of the thyroid cartilage about an inch and three-quarters in length, were made in other respects as in the operation of M. Begin, until they reached the outer edge of the sterno-thyroid muscle. The further separation of parts was effected either with the fingers or with the handle of the scalpel. A male silver catheter was then introduced by the mouth, and its point made to project, carrying the dilated gullet upon it. Into this he next made a small opening, through which he introduced the polypus forceps for seizing and removing the foreign substance. The pharynx at any part above the lower border of the cricoid cartilage, is quite as accessible on the right as on the left side. But immediately below this point the œsophagus begins to shift slightly from the median line, and inclines towards the left during the rest of its course along the neck. The selection of the right side as the field of the operation, except when the foreign body is found projecting on this side, appears, then, to be objectionable, especially where the œsophagus has to be opened low down.

I need not again repeat the steps of my own operative procedure, further than to state that it differed from both of the foregoing ; first, in requiring a transverse as well as longitudinal incision of the integuments, partly for securing small vessels, but principally for exposing the diseased lymphatic gland that lay in the track of the dissection ; and secondly, at the close of the operation, in requiring the thyroid gland to be partly detached, and the sterno-mastoid muscle to be divided transversely in order to expose the œsophagus at the lower part of the wound, and to gain sufficient room for securing the inferior thyroid artery in case it had been injured.

Notwithstanding Mr. Arnott's remark that œsophagotomy is a less formidable operation than is usually supposed, it is one that should never be undertaken without a full and deliberate view of its attendant difficulties. The chance of wounding the great vessels and nerves on the side of the neck is comparatively small, as these are readily drawn aside. The recurrent nerve, if brought into view at all, is easily avoided by approaching the œsophagus on its outer side somewhat toward its posterior aspect. A hasty stroke of the knife, at this stage of the operation, might endanger the recurrent nerve, the blood-vessels or other parts on the opposite side of the neck. If the incisions are rather too high up, the bistoury may wander into the cellular tissue between the different layers of the pharyngeal muscles. The superior laryngeal nerve, and occasionally some deep veins passing towards the internal jugular, will be endangered when the incisions through the layers of deep fascia are carried above the level of the thyroid cartilage. The superior thyroid artery, or its branches, appears to have been divided in every case hitherto mentioned, and to have been readily secured without

leading to any alarming hemorrhage. The surgeon, however, cannot be too cautious in approaching the inferior thyroid, which, from its depth, size and source, might prove externally troublesome if divided. In no instance, as yet, has it been injured; although in my own, as well as in some of the other operations, it must have been closely approximated.

Having now spoken of *œsophagotomy* as a mode of relieving such strictures as are within the reach of an incision on the side of the neck, another question naturally arises:—what measures should be adopted for the relief of strictures of the *œsophagus* so situated as to be inaccessible in this way?

This question, of course, applies only to such organic obstructions of this organ as are irremediable by bougies and other means of mechanical dilatation, and so severe as to threaten total and immediate obliteration of the passage. Time may be gained and the patient's life prolonged for weeks, in such cases, by the use of nutritive injections. But the most that can be expected from these, where any hope remains of preserving the patient's life, is a temporary respite from more efficient measures.

Organic strictures may occur at any point in the course of the *œsophagus*; but the most frequent seat of deep strictures is at its transit through the diaphragm, or just above its termination. I had occasion, about three years since, to prescribe for a gentleman from New Jersey with a stricture thus situated. For some months he subsisted wholly on fluids; and these he swallowed with the utmost difficulty. He finally died of inanition. The disease, in this case, was probably scirrhus. But disorders of a different character, leading to the same result, may attack this part; as in the case of a lady with a tubercular affection, to which I have already alluded; in cases resulting from chemical or mechanical injuries, and in certain malformations of the *œsophagus* interfering with deglutition, and yet, possibly, not beyond the reach of art. An instance of the latter sort was reported by M. Martin, of Aubagne, to the Medical Society of Marseilles: The infant refused all nourishment, or this, when forced down, was immediately rejected. The child lived only thirty-six hours. The *œsophagus* terminated in a cul-de-sac, just below the pharynx, and the stomach communicated by a canal, of the calibre of a small quill, with the trachea near its bifurcation.\*

Incised and even gun-shot wounds have often penetrated the stomach without resulting fatally. Injuries of this sort are, unquestionably, among the severest and most alarming; but their proportion of deaths to recoveries is perhaps fully estimated by Percy, who calculates that out of twenty cases only four recover. Ettmuller† and Hevin have recorded cases, and

\* New York Medical Repository, vol. xxii. p. 244.

† *Aeta Physico-Medica*, Obs. LII. vol. iii, p. 168. In this paper Ettmuller refers to the following authors as furnishing confirmation of the curability of wounds of the stomach, viz.:

Galen, Albucasis, Julius Alexandrinus, Fallopius, Job. Matthæus, Jo. Schenck, Dan. Becker, Diembroek, Menzel, Blegny, Wolff and Cowper. To this list, Hevin adds three



furnished us with numerous references to recoveries after such injuries, recorded among the writings of the older authors since the days of Galen. But Plouquet, according to Hennen, has exceeded all others in the vast number of cases he has amassed. Hennen himself\* refers to two successful cases in the practice of Dr. Thompson, after the battle of Waterloo, to another in the *Philosophical Transactions*, and to others in the writings of Kluyskens, Schlichting and Percy; and Permannus is said to have often stitched the stomach in his practice with the army. The following instance I have condensed from the original report of it, in the *New York Medical Repository*, vol. xv. p. 215:

In the month of June, 1784, three men undertook to secure a runaway negro, who was armed with a large knife. The negro, in defending himself, gave one of them a back-stroke with the instrument, which entered near the cartilages of the false ribs on the right side, penetrated into the stomach and passed nearly transversely the cartilages on the other side. The wound was about two inches below the ensiform cartilage and nearly three inches long externally. The stomach was opened by a wound of more than two inches long. The dinner, which the man had taken just before the accident, consisting of bacon, cabbage and cider, was partially discharged through the cut, and part of it escaped into the peritoneal cavity. The wound was sewn up by an old soldier with an awl, needle, and thread. The patient was seen, for the first time, by Dr. Archer, of Maryland, (who has recorded the case,) some forty-eight hours after the accident. The stitches being only through the skin, were then removed. The patient was kept on his back, and nourished with strained soups; the wound was kept clean, and dressed twice a day. At the doctor's second visit, on the ninth day, it looked well, and the patient was free from fever. He complained of soreness at the right groin, which was swollen, hard and inflamed. A poultice was applied and continued until suppuration occurred. The swelling at the groin was then opened, and a large quantity of pus, mixed with pieces of cabbage, was evacuated. The patient suffered more from this abscess than from the wound in the stomach. After the matter was discharged both wounds healed up. Dr. Archer often saw the man after his recovery. The only permanent inconvenience resulting from the accident was a hernial protrusion of the stomach, about the size of a goose-egg, which would appear after eating or drinking, and recede when the stomach was empty.

Having now shown that wounds of the stomach are far from being necessarily fatal, we may next proceed to show that openings, whether the

cases on his own authority from the records of the academy, and further references to others in the writings of Christoph. a Vega, Matth. Carnax, Bern. Suevus, Sennertus, Bohnius, Jacob Oetheus, J. F. Hildesius, Selveltetus, Wolsius, Felix Platerus, Le Dian, and to others in the *Ephemerides*, Dec. 2, Ann. 1; and Dec. 1, Ann. 10, &c.

\* *Principles of Military Surgery*, Philadelph. 1830, p. 346.



result of injury or occurring spontaneously, may give rise to permanent fistulous communications between the stomach and external surface of the abdomen, and that such fistulæ may exist for years without interfering with digestion or impairing the general health. A most remarkable example of this sort was published in 1803, by Dr. Jacob Helm, of Vienna, an abstract of which may be found in the 12th vol. of the N. Y. Med. Repository. The following is the case still more abbreviated:

Theresa Petz, of Breitenwaida, a village seven miles from Vienna, the wife of a blacksmith and mother of seven children, had, for many years, suffered from an obscure and painful affection of her stomach. A tumour, not larger than a hazelnut, appeared, in 1790, over the region of the stomach and slowly increased until 1796, when it extended to the navel. In April, 1797, it suppurated, broke, and gave issue to a pint of thin, yellowish matter. The dropsical swellings and occasionally agonizing pains, which she had long endured, entirely disappeared within a fortnight afterwards; and for many years subsequently she continued in good health. The opening into the stomach was at first small, but readily gave issue to particles of food. In the July following its first occurrence, it was large enough to admit the finger; it afterwards acquired an extent of two inches in diameter. A catheter was often introduced into the upper and lower orifices of the stomach without exciting pain, vomiting or any other unpleasant symptom. She sometimes washed out the stomach with milk and water, and occasionally she relieved herself of an over-amount of food by removing it from the stomach through the opening. After the washing with milk and water, she was usually obliged to take food for relieving a sense of distress and uneasiness. When she was riding in a wagon, or subjected to any considerable motion, the bile would rise into her stomach and issue from the opening. She attended to all her domestic affairs, and was usually in good spirits. In 1800 she was able to attend to field-labour, and to walk to Vienna to show herself to physicians and other curious persons.

Ettmuller, in the *Acta Physico-Medica Academiæ Cæsareæ Naturæ Curiosorum*, (vol. iii. p. 170,) published at Nuremberg, for the year 1733, gives an instance somewhat similar: A single woman, aged thirty, the house-keeper of a very celebrated man, consulted me last year, says he, in reference to a hole about the size of a large pea in her left hypochondriac region, surrounded by inflamed and indurated integument, and giving issue to portions of her food and drink. She referred this indirectly to a fall against the top of a post, which happened to her when she was only ten years old. After the injury, an indolent swelling appeared over the stomach, which eventuated in the fistulous opening. Her exercise and active habits appeared to prevent this from closing. On changing her mode of life and confining herself for a few weeks to bed, the fistula contracted, and she is now, says the report, getting on prosperously.

M. Richerand gives another case. This patient was also a female, aged forty-seven. The opening, as in the foregoing instance, had resulted from an indolent swelling, caused by a local injury many years before its breaking. The fistula was seated at the upper and left portion of the epigastrium. It was of an oval form, eighteen lines long by rather more than an inch wide, allowing the inner surface of the stomach to be seen through it. She became a patient at La Charité, under the care of M. Corvisart. At this period her appetite was equal to that of three ordinary women of her age. The fistula had existed about nine years. Three or four hours after eating she was usually obliged, from a sense of uneasiness, to remove the compresses with which she covered the fistula, to give issue to the contents of the stomach. After this escape of food, which was discharged with a considerable quantity of gas, she was accustomed to wash out the stomach with an infusion of chamomile. This quieted her, and enabled her to sleep. Her bowels were habitually constipated; her urine was small in quantity; her pulse was weak and rarely over forty-six beats in a minute: she was feeble and emaciated, probably from want of nourishment; only a small portion of the food which she took passed beyond the pylorus. She died of a colliquative diarrhœa six months after her admission into the hospital. The stomach was found intimately united to the abdominal parietes. The opening into it was at the union of the two left thirds with the right third; or about eight fingers' breadth from its great extremity, involving only the pyloric portion. No other organic lesion was discovered.\*

A case more remarkable than either of the foregoing is the well-known instance of the Canadian, Alexis H. Martin, recorded by Dr. Beaumont, of the United States Army. The fistula in this case resulted from a gunshot wound. He lived for many years after its occurrence in the employ of Dr. B., who was in the habit of frequently inspecting the stomach, and making all sorts of experiments upon its inner surface through this opening, preparatory to the publication of his work on digestion.†

Mr. Hennen refers to a case of Ettmüller's in the fifth volume of Haller's "*Dissertationes Chirurgiæ*," probably the same which I have quoted above, in which the fistula remained open ten years; and Wenker, in the same volume, says he, relates another in which a wound of the stomach continued open for twenty-seven years.

But the remarkable cases to which we have just referred, much as they might warrant the propriety of establishing an artificial opening into the stomach, as a last resort in some severe cases of strictured œsophagus, are, after all, not so much in point as others that yet remain to be noticed. For if the early records of surgery are worthy of confidence, this formidable

\* *Physiologie*. Paris, 1833. Tom. I. p. 252.

† *Experiments and Observations on the Gastric Juice and the Physiology of Digestion*. By Wm. Beaumont, M. D., Plattsburgh, 1833.



operation has actually been performed, on three several occasions, for the removal of sharp instruments from the stomach. These cases are related in the German Ephemerides, and quoted by M. Hevin in his essay above referred to, from which I have made the following abstract.

A young Prussian peasant, feeling some uneasiness in the stomach, attempted to excite vomiting by introducing a knife with the shaft downward into his throat. The instrument slipped from his fingers and fell into the *œsophagus*. He attempted to dislodge it by placing himself head-downwards, but failing in this, he finally washed the instrument into his stomach with a draught of beer. The surgeons of Kœnigsberg, whom he consulted, advised him, in view of the dangers to which he was now exposed, to have the knife removed by an incision; and Daniel Schwaben, a lithotomist, was selected as the operator. About a month and a half after the accident, having already been prepared for the operation by a gentle purge, and by oleaginous and balsamic medicines, the patient was tied to a plank, and the course of the proposed incision was marked with pen and ink over the left hypochondrium. The external incision was made longitudinally, to the extent of two inches. The stomach being empty at the time, did not present at the wound, and the surgeon was obliged to seize and draw it outward by means of a curved needle. The projecting point of the knife was easily recognized through the coats of the stomach. An incision was made into the organ immediately over the instrument, through which it was promptly extracted and found to be about ten inches long. The edges of the wound in the stomach required no sutures. The incision of the integuments was drawn together by five peg sutures (*chevilles ou agrafes*). No serious symptoms ensued, and the patient soon got well. The knife and a portrait of the young peasant himself, says the report, are both preserved in the electoral library at Kœnigsberg.

The German jugglers of former days must have had strong stomachs, and been more matter-of-fact sort of people than some of their sublimated descendants. Infinitesimal potions of silex and microscopic globules of sulphur they would have scorned, at the sight of a tasty jack-knife. A young fellow of Sprague, out of mere sport, says Crollius, swallowed a knife nine inches long, the point of which presented a little above the fundus of the stomach, towards its left side; and the handle, towards the spine. Two months afterwards, it was successfully extracted from the stomach by Florian Mathis, first surgeon to the emperor.

Again.—A Prussian woman had the misfortune to swallow a knife seven inches long, which she had introduced into the throat to excite vomiting. At first it stuck in the *œsophagus*, but afterwards gradually descended into the stomach, where it remained three days without causing any pain. She afterwards felt pricking sensations, and very soon the point of the knife could be felt in the left side. The pains increasing forced her to seek advice. Dr. Hubner, of Rastembourg, to whom she applied, made an incision over



the point of the knife in the left hypochondrium, on the eleventh day of the accident. He found that the blade had already pierced through the stomach, and had excited slight suppuration around it. The knife was withdrawn with a pair of forceps. Her cure was afterwards very prompt.

It would take us too far out of our way to refer to instances of foreign bodies successfully removed from other portions of the alimentary canal.\* Enough, I presume, has been advanced to show that, under pressing circumstances, and as an extreme measure, the operation of opening into the stomach, for the purpose of supplying it with food, is sufficiently warrantable, and that, under some circumstances, it may be the means of preserving or prolonging life.

The anatomical or surgical knowledge requisite for performing it with safety, so far as the process itself is concerned, is immeasurably less than is called for in numerous comparatively trifling operations. Its immediate danger is from hemorrhage; its more remote, from peritonitis; and its ultimate, from impaired action of the stomach. The loss of blood is not likely to be severe, except from penetrating into the stomach near its upper or lower curvature in the situation of its greater blood-vessels. Peritonitis may possibly be avoided by preventing the escape of blood, or of any of the contents of the stomach into the peritoneal cavity, as well during as after the operation; by avoiding any injury to the omentum, and all undue manipulation with the serous surfaces; or it may be controlled by depletion, anodynes and other measures employed for the treatment of ordinary peritoneal inflammation. The stomach being necessarily empty under the circumstances, calling for the measure in question, the lower edge of the liver, or the colon distended with gas, might interfere with our attempt to bring it into view. But these organs can be readily avoided, or pushed aside. The case quoted from M. Richerand would seem to show, that the functions of the stomach would be most impaired where the opening had been made into its pyloric portion. Other cases would lead us to infer that serious nervous symptoms, at the time of the wound, would be most frequent when the opening was effected near the cardiac orifice. The place of election, then, for opening the stomach, would be at equi-distance from its two extremities, and midway between its two curvatures, at its anterior prominence.

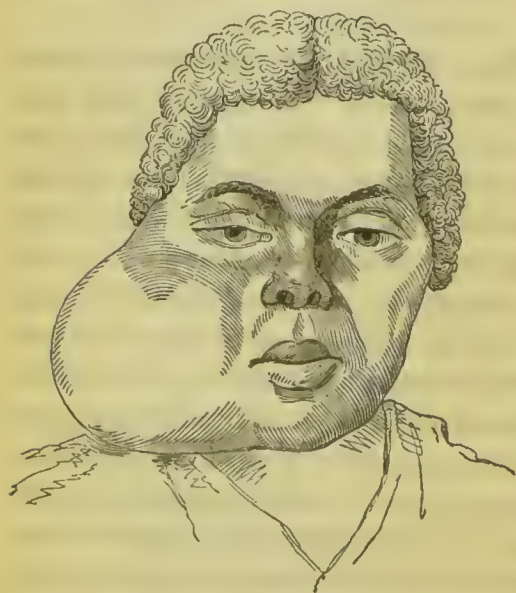
NEW YORK, *July*, 1844.

\* Some of these are referred to by Mr. Hevin. But perhaps the most interesting fact of the sort on record is given by Dr. White, senior, of Hudson, N. Y. Dr. W., August 7th, 1806, removed, by incision, and with complete success, a silver teaspoon from the small intestine of a person who had swallowed it, in a fit of delirium, about a month previous. For a full report of the case see N. Y. Med. Repos., vol. x. p. 367.

ART. III.—*Osteo-Sarcoma*. By CHARLES BELL GIBSON, M.D., Professor of Anatomy in Washington University of Baltimore.

Hagar Jennings, coloured, from Anne Arundel county, aged 35 years, was brought to my office on the 5th of June by Dr. Richard H. Thomas, of this city, for the exploration of a tumour situated on the right side of the

Fig. 1.



face. The accompanying figure gives an accurate representation of her appearance. At the first glance, the disease appeared to involve the upper as well as the lower jaw; but careful investigation soon satisfied us that such was not the case. The tumour was round and very regular; the skin tense, and free from ulceration. Anteriorly, the boundary of the disease seemed to be the first bicuspid tooth; posteriorly, the tumour stretched two inches beyond the parotid region. The base was about an inch lower than the base of the sound side; and the superior aspect was on a level with the

lower eyelid. Within the mouth the extent of the disease was less; the finger could be introduced, though with difficulty, between the outer side of the upper jaw-bone and the inner face of the tumour; it encroached, however, very much upon the fauces, pushing the uvula to the left side, and dipping to some extent into the pharynx.

The tumour began to form six years ago, and is attributed by the patient to carious teeth, and to the irritating domestic remedies she used for relief of the pain. From the posterior margin of the tumour to the termination of the disease at the bicuspid teeth, the measurement was 9 inches, and from the superior to the inferior surface  $7\frac{1}{2}$  inches.

The motions of the joint, although limited in extent, were perfect.

The sensations communicated to the finger in examining the tumour were different in different points. At one spot, that of extreme hardness; and at another, that of softness amounting almost to fluctuation. Again, the parietes were elastic, and presented the peculiar sensation which the mixture of bone and cartilage invariably offers in these affections.

The disease was pronounced to be osteo-sarcoma, and an operation sug-